Owner's Manual

Evolution Series

870A

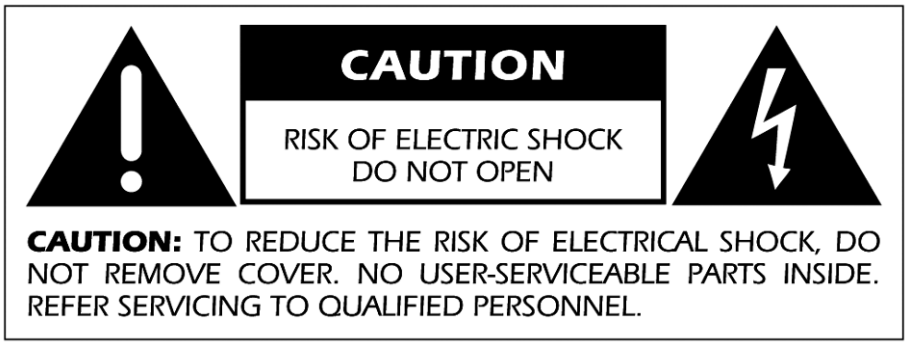
Reference Dual-Mono Power Amplifier

M O O N

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or another apparatus that produces heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for safety. If the provided plug does not fit into the outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. Unplug mains cord during transportation.
11. Only use attachments and accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power cord or plug has been damaged; liquid has been spilled or objects have fallen into the apparatus; or the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. No naked flame sources, such as candles, should be placed on the apparatus.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

Important Safety Instructions (cont'd)

The lightning flash with the arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Marking by the "CE" symbol (shown left) indicates compliance of this device with the EMC (Electromagnetic Compatibility) and LVD (Low Voltage Directive) standards of the European Community

Please read all instructions and precautions carefully and completely before operating your Simaudio MOON 870A Dual-Mono Power Amplifier.

1. **ALWAYS** disconnect your entire system from the AC mains before connecting or disconnecting any cables, or when cleaning any component. To completely disconnect this apparatus from the AC mains, disconnect the power suppy cord plug from the AC receptacle.
2. The MOON 870A must be terminated with a three-conductor AC mains power cord which includes a protective earthing connection. To prevent shock hazard, all three connections must **ALWAYS** be used. Connect the MOON 870A only to an AC source of the proper voltage; Both the shipping box and rear panel serial number label will indicate the correct voltage. Use of any other voltage will likely damage the unit and void the warranty
3. AC extension cords are **NOT** recommended for use with this product. The mains plug of the power supply cord shall remain readily accessible.
4. **NEVER** use flammable or combustible chemicals for cleaning audio components.
5. **NEVER** operate the MOON 870A with any covers removed. There are no user-serviceable parts inside. An open unit, especially if it is still connected to an AC source, presents a potentially lethal shock hazard. Refer all questions to authorized service personnel only.
6. **NEVER** wet the inside of the MOON 870A with any liquid. If a liquid substance does enter your MOON 870A, immediately disconnect it from the AC mains & take it to your MOON dealer for a complete check-up.
7. **NEVER** expose the MOON 870A to dripping or splashing of liquids and no objects filled with liquids, such as vases, shall be placed on top.
8. **NEVER** block air flow through ventilation slots or heatsinks.
9. **NEVER** bypass any fuse.
10. **NEVER** replace any fuse with a value or type other than those specified
11. **NEVER** attempt to repair the MOON 870A. If a problem occurs contact your MOON dealer.
12. **NEVER** expose the MOON 870A to extremely high or low temperatures.
13. **NEVER** operate the MOON 870A in an explosive atmosphere.
14. **ALWAYS** keep electrical equipment out of reach of children.
15. **ALWAYS** unplug sensitive electronic equipment during lightning storms.
16. **WARNING:** Do not expose batteries or battery pack to excessive heat such as sunshine, or fire or the like.

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Date Code: 20140909

Introduction

Thank you for selecting the **MOON 870A** Dual-Mono power amplifier as a part of your hi-fi reproduction system. This power amplifier has been designed to offer state-of-the-art high-end performance in an elegant package, while retaining all the sonic hallmarks on which Simaudio has made its reputation. We have spared no effort to ensure that it is among the finest two-channel amplifiers available. We have been building high-performance audio equipment for over 30 years, and the know-how gained through our cumulative experience is an important reason why **MOON** amplifiers are so musically satisfying.

Your new amplifier is a true Dual-mono design, whereby each channel operates completely independent of the other. The chassis, power cord and power switch are the only parts of this amplifier that both channels share. The performance of your **870A** will continue to improve during the first 300 hours of listening. This is the result of a "break-in" period required for the numerous high quality electronic parts used throughout this amplifier.

Before setting up your new **MOON 870A**, we encourage you to please read this manual thoroughly to properly acquaint yourself with its features. We hope you enjoy listening to the **MOON 870A** Dual-Mono power amplifier as much as the pride we have taken in creating this fine audio product. We understand the power and emotion of music and build our products with the goal of faithfully capturing these elusive qualities.

The information contained in this manual is subject to change without notice. The most current version of this manual is available on our official website at http://www.simaudio.com

Your **MOON 870A** Dual-Mono Power Amplifier incorporates many significant design features to achieve its "world-class" level of performance. This is an abbreviated list of the more important features:

Proprietary **"Lynx"** Technology which eliminates feedback. The results are: Real-time amplification is achieved since interactions from the speaker back to the amplifier are virtually eliminated; More accurate musical reproduction with respect to tonality; Virtually non-existent transient intermodulation distortion (which is far more degrading to sonic performance than harmonic distortion); The elimination of common phase errors resulting from feedback.

A custom **proprietary toroidal transformer design** with lower magnetic, electrical and thermal loss, yielding an improved power transfer and lower regulation factor, resulting in increased current speed and better dynamics.

Fully **balanced differential** circuitry up to the output stage.

Output stable to any known speaker impedance.

Class A output to 5 watts for greater efficiency.

RS-232 port for i) full unsolicited bidirectional feedback in custom installation setups and ii) firmware updates.

An **oversized** power supply.

An **exceptionally short signal path** for a faster transient response.

Precision matched and fully decoupled **proprietary MOON Bipolar Output transistors** with unprecedented gain linearity resulting in improved bass response and even more accurate sonic reproduction.

A **high damping factor** which yields superior musical dynamics, improved signal speed and refined timbre accuracy.

Ultra rigid chassis construction to minimize the effects of external vibrations.

Designed to be **powered up at all times** for optimal performance.

Unpacking

The **MOON 870A** power amplifier should be removed from its box with care.

The following accessories should be included inside the box with your amplifier:

- ✓ *AC power cable*
- ✓ *This owner's manual*
- ✓ *Warranty and product registration information (USA and Canada only)*

Once the **870A** is unpacked, inspect it thoroughly and report any damage to your dealer immediately. We suggest that you keep all of the original packaging, storing it in a safe, dry place in case you're required to transport this product. The customized packaging is specially designed to protect the **870A** from any potential damage during transit.

Please write the serial number of your new **MOON 870A** in the space provided below for future reference.

Serial No.: _____

Installation & Placement

The **MOON 870A** Dual-Mono power amplifier is both powerful and heavy. It requires reasonable ventilation to maintain an optimum and consistent operating temperature, especially since it will radiate heat when driven hard. Consequently, it should be placed in a location with empty space around it for proper heat dissipation. You should never place another component on top of this amplifier. As well, the amplifier should be placed on a solid level surface. You should avoid placing it near a heat source or inside a closed cabinet that is not well ventilated as this could compromise the amplifier's performance and reliability. The **870A** uses two large toroidal transformers in its power supply; even though they are well shielded, you should not place this amplifier too close to source components sensitive to EMI, such as turntables, phono preamplifiers and CD Players.

If the surface you have chosen isn't perfectly level, each of the four (4) cones of your **870A** are height adjustable; carefully using your fingers, you can either raise each leg by turning the cone underneath clockwise, or lower each leg by turning it counterclockwise.

We strongly recommend that you leave these cones mounted to the component at all times for reasons related to both performance and aesthetics.

Rear Panel Layout

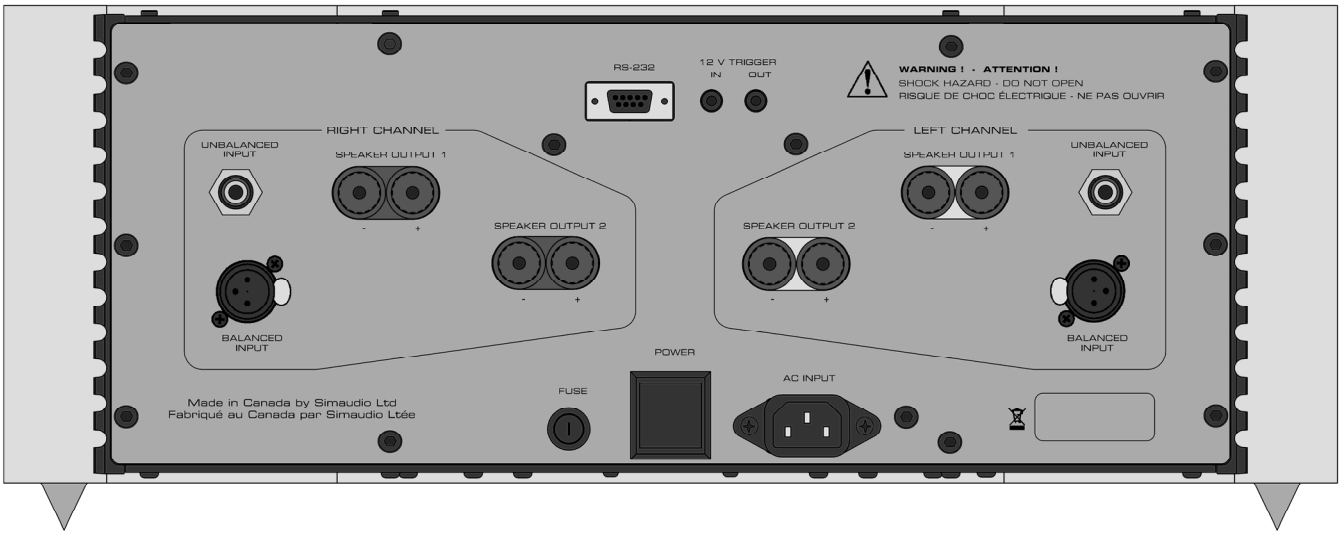

Figure 1: Rear panel of Moon 870A Dual-Mono Amplifier

The rear panel will look similar to Figure 1 (above). Each channel has one balanced (differential) input on an XLR connector and one unbalanced (single-ended) input on a RCA connector. There is no switch to toggle from balanced mode to single-ended mode. You may operate the amplifier in either mode, but only one mode at one time for each channel. When you're using the balanced XLR inputs, **you must first remove the factory installed "dummy" XLR jumpers** (see figure 2 below) from the back panel XLR connectors and store them in a safe place. These jumpers are required ONLY when using the single-ended RCA inputs. If you decide to switch to single-ended input mode, you must reinstall the XLR jumpers (between pins 1 and 3) exactly as show below:

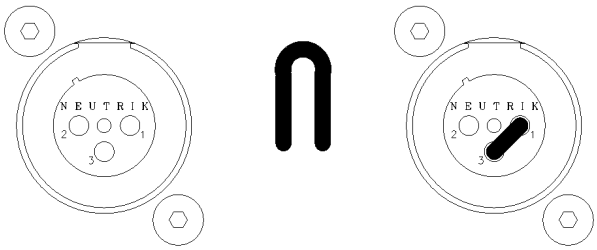

Figure 2: XLR connector without and with jumper accessory

There are two pairs of heavy duty gold-plated speaker binding posts for each channel to accommodate bi-wiring. They are each labelled "Speaker Output 1" and "Speaker Output 2".

The upper mid-section has an RS-232 input on a DB9 connector. To the right of this connector are two 12 Volt triggers, each on a 1/8" mini-jack; one input and one output, the latter for use in the event that wish you to "daisy chain" a second power amplifier on the same trigger circuit. The lower mid-section has from left to right; the "AC Fuse" socket cover; the power "main switch"; and the "AC Input" IEC receptacle for the power cord.

Connecting the 870A

Prior to making any connections or removing the XLR jumpers, the power amplifier must be turned off and the AC cable disconnected for at least 1 minute.

1. Connect the input cables running from your preamplifier's outputs, whether balanced or single-ended, to the amplifier' s XLR or RCA inputs, respectively. We highly recommend that you use the balanced XLR inputs (provided that your preamplifier has balanced outputs) to take full advantage of **870A** Power Amplifier's capabilities. Please refer to the next section, "Balanced Operation" on for further information.

   Do <u>not</u> connect cables to both the XLR and RCA inputs at the same time. Damage to both the 870A and the connected equipment can result that is not covered by warranty.

   Don't hesitate to use high quality interconnect cables*****. Poor quality interconnect cables can degrade the overall sonic performance of your system. It is recommended, though not mandatory, to use balanced interconnects between your preamplifier and the **870A** when using long cable runs (i.e. more than 3 meters in length).

2. Connect your speakers, with the cables of your choice, to the **870A**'s speaker binding posts. Take care to respect the polarity ("+" , "-") of the outputs. Once again, don't hesitate to use high quality speaker cables*****. Poor quality speaker cables can degrade the overall sonic performance of your system.

3. Connect the supplied AC power cable to the IEC receptacle, located on the amplifier's rear panel. Ensure that the AC wall outlet you use has a functioning ground. For the best sonic performance, it is preferable that you plug your **870A** directly into a dedicated AC outlet and avoid using an extension cord. If you have the time and willingness, consider installing a superior quality AC wall outlet such as a hospital grade Hubbell*****.

***** Please speak with your MOON Authorized Retailer about the benefits of high quality cables for your system, and superior quality AC wall outlet.

Balanced Operation

When using an unbalanced interconnect, the audio signal runs through both the center wire and the shield/ground wire. Any noise picked up by this interconnect (ie. nearby magnetic fields such as an AC power cord) will be reproduced by the amplifier and heard through the loudspeakers. Conversely, a balanced interconnect has three separate conductors; one for the ground and two for the actual signal. These two signals are identical except that one is 180 degrees out of phase with the other. For example, when one conductor is carrying a signal of +5 Volts, the other will be carrying a signal of –5 Volts. When these two inverted signals on a balanced line are input into a differential power amplifier such as the **MOON 870A**, any noise picked up by the interconnect will be eliminated since a differential circuit amplifies only the difference between these two signals: Noise on a balanced interconnect will be equal on both conductors and therefore cancel out.

Bridged-Mono Operation

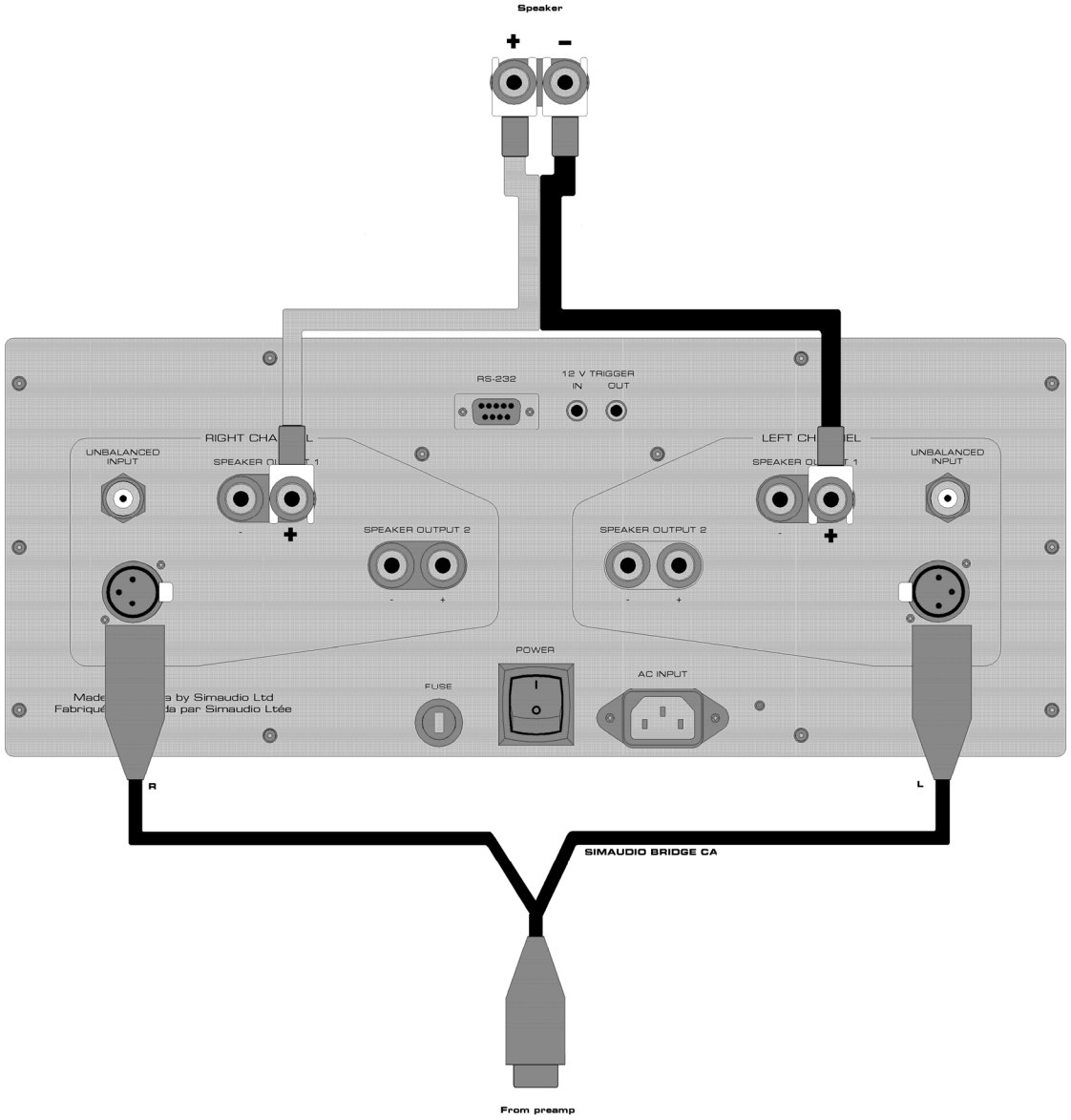

Figure 3: Bridged-Mono operation of the MOON 870A Dual-Mono Amplifier

If wish to operate the **MOON 870A** Dual-Mono Power Amplifier as a monoblock amplifier, it can be converted to bridged mode without any complex modifications. Only a Simaudio XLR-BRIDGE Y-cable is required. This custom cable will allow one input signal to be sent to both channels of the amplifier's inputs, as pictured above in Figure 3. One lead from the "Y" adapter must plug into right channel input and the other lead must plug into left channel input. As well, you must use the positive terminal of each output binding post (exactly as in figure 3) for the loudspeaker connection. If you are unsure about how to accomplish a bridged-mono mode of operation, don't hesitate to contact your **Authorized MOON** dealer.

The MOON **870A** produces 1200 watts of output power at 8 ohms for a single channel when operating in bridged-mono mode.

Operating the 870A

We recommend leaving your **870A** powered up at all times to maintain optimal performance. When you plan on being away for a few days, it may not be a bad idea to power off your amplifier. Please keep in mind that once fully "broken-in", your **870A** requires several hours of operation before reaching optimal performance after powering it up again.

Turning on your MOON 870A for the first time

Prior to turning the amplifier on for the first time, make sure that every cable is properly connected to avoid any problems. Then turn on your preamplifier connected to the **870A**. Flick the main rocker switch, located on the rear panel, labeled "POWER" to the '1' (on) position. The blue LED on the front panel will blink for up to 10 seconds while it achieves standby mode. When it stops blinking and is not illuminated, your **870A** is in standby mode. Next, briefly press the push button labeled "Standby" located on the front panel. You will hear a very faint click sound confirming that everything is in order. The blue LED on the front panel will illuminate, indicating that the **870A** is now powered up and ready for use.

On and Off Sequence

To avoid having any annoying noises (ie. "thumps" and "pops") emanate from your speakers when powering your **870A** on or off, you should always power up your preamplifier prior to powering up your **870A.** As well, always power down your **870A** prior to powering down your preamplifier.

Troubleshooting

The blue LED located on the front panel also indicates the operational status of your **MOON 870A** Dual-Mono power amplifier. When the LED starts blinking on and off during use, the circuitry is either over-heating or has detected the presence of DC in the input signal:

Left Channel DC protection ..... LED blinks 2 times
Right Channel DC protection ..... LED blinks 3 times
Left Channel Over-heating..... LED blinks 4 times
Right Channel Over-heating ..... LED blinks 5 times
Unknown Problem ..... LED blinks 6 times

Your **MOON 870A** is a "smart" power amplifier equipped with a self-diagnostic system that will automatically shut itself down when it detects DC (direct current) from any input. If your **870A** power amplifier turns itself off or will not power up, there may very well be DC present in one (or more) of the amplifier's inputs coming from one (or more) of your preamplifier/processor's outputs or connected source components. You must determine if there is any DC present. The best way to accomplish this is by first powering down the **870A** via the main power rocker switch, then physically removing all inputs to the **870A** leaving only the speakers connected. Attempt to power up your **870A** again: A successful power up will indicate the presence of DC coming from your preamplifier or one of your signal sources (ie. CD Player).

If your **870A** still doesn't power up, turn off the main power switch and check the AC fuse. If the fuse appears OK, put it back in its socket and then try to power up again the usual way. If the fuse is blown, replace it with a fuse of the same rating, and repeat the above process. At this point, you should be able to power up your **870A**. If not, immediately consult your dealer for assistance.

Remote Operation

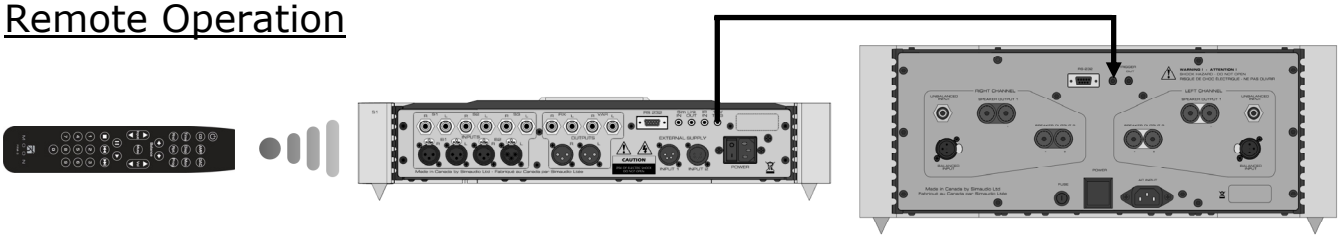

Figure 4: Remote Operation with 12V Trigger

In figure 4 we have a **740P** Preamplifier and **870A** amplifier connected together via their respective 12V triggers; The 12V trigger output on the **740P** is connected to the 12V trigger input on the **870A** (using a 1/8" mini-jack cable). When you turn on the **740P** via remote control (or its Standby button), the **870A** will turn on automatically. The same rule applies when you put the **740P** into Standby mode.

Specifications

Configuration	Dual Mono
Power Supply Transformers	2 x 1.3kVA
Power Supply Capacitance	240,000µF
Class Of Operation	A/AB
Design	Fully Balanced Differential to output stage
Input Impedance	47,500Ω
Input Sensitivity	1400mV
Output Device Type	Bipolars - 16 per channel
Output Power at 8Ω	300 Watts per channel
Output Power at 4Ω	600 Watts per channel
Output Power – Bridged Mono at 8Ω	1200 Watts
Frequency Response	10Hz - 200kHz +0/-3dB
Output Impedance	0.01Ω
Damping Factor (static)	800
Gain	31dB
Signal-to-noise Ratio	> 106dB @ full power
Maximum Output Voltage	58 Volts
Slew Rate	42V/µs
Maximum Current – Peak	72 amperes
Maximum Current – Continuous	30 amperes
Crosstalk @ 1kHz	-105dB
Intermodulation Distortion	Unmeasureable
THD (20Hz - 20kHz @ 1 watt)	< 0.015 %
THD (20Hz - 20kHz @ 300 watts)	< 0.04 %
Power Consumption @ idle	70 Watts
AC Power Requirements	120V / 60Hz or 240V / 50Hz
Shipping Weight	98 lbs / 44 Kgs
Dimensions (W x H x D, inches)	18.75 x 7.5 x 17.5

Balanced Pin Assignment:

	Pin 1	Ground
	Pin 2	Positive
	Pin 3	Negative

12 Volt Trigger:	Logic	Direct (0V off, 12V on)
	Jack	3.5mm microphone jack
	Input Impedance	1kΩ
	Current Consumption	12mA

NOTE: If you require the RS-232 codes for your **870A**, please visit the "Contact Us" page and complete the "Information request" form on our website at www.simaudio.com.

Fuse Replacement: For the 120V version use a 10A fast blow (3AG size).
For the 230V version use a 5A fast blow (3AG size).